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ABSTRACT

The Women in Machining (WIM) program is a Machine Action Project (MAP) initiative that was developed in response to a local skilled metalworking labor shortage, despite a virtual absence of women and people of color from area shops. The project identified post-war stereotypes and other barriers that must be addressed if women are to have an equal opportunity in machining and other skilled trades. Short-term barriers include sex bias in assessment, testing, and counseling; lack of career information; and math or technical anxiety. Support services are essential to eliminate ongoing barriers, such as lack of affordable child care; lack of information about local industry; sexual harassment and discrimination; family opposition; lack of transportation; and financial hardship. To get WIM started, MAP has taken deliberate steps to develop contacts with various sectors of the community and to create materials necessary for active recruitment, including a survey of machine shops to identify machinists who are women and people of color; organization of a Committee on Women in Machining; and establishment of high support services. Program experience suggests recommendations for training providers, employers, labor unions, community organizations, policymakers, and women in the trade to recruit and support women in the workplace. (Lists 13 organizational resources.) (YLB)

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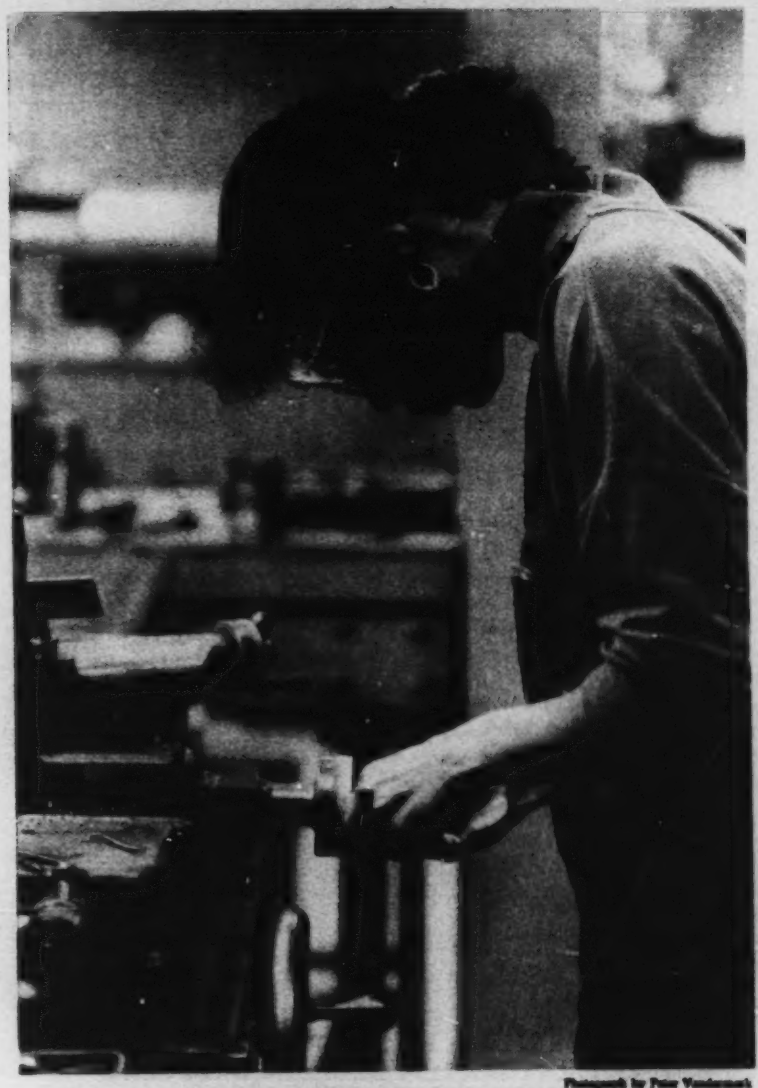
Access, Equity, and Opportunity

Women in Machining: A Model Program



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September 1989

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Thank you all!
-Heather Warner

IN THEIR OWN WORDS:

"Most people say they like machining because it's working with your hands. For me it isn't working with my hands it's working with blueprints. You can actually read the blueprint. You've got the dimensions, you've got the special language, and you've got a chore to accomplish. Machining is fascinating because each machine is different. You have to be able to adjust each machine and know what keeps that machine running perfectly. I want to work at a shop where they'll keep training me. Working on Bridgeports and lathes is a craft and it makes you want to be the best machinist in the world! It's a comfort to know that there is 10 years of knowledge out that you haven't yet learned.

I need to work to earn a salary. I've got to be able to support myself and my children. You know, there's not another person supporting me. Raising two children completely on my own and getting to school has been a real challenge, but, it has also been a growing experience. When my kids saw me in my work boots they said, 'Mommy, are you a carpenter?' . They like to be doing whatever I'm doing so now they want to be machinists. They think my smock is great."

- Barbara Ede, machine shop trainee

"I like machining because it's a constant challenge. I'm using my hands as well as my brain. Also, there's a product to see at the end of the day. It's tangible. I can see myself progress in my skills and that makes me feel good!"

- Michele Morgan, machine shop trainee

A. PURPOSE OF THIS REPORT.

"Sixty to seventy percent of the people coming in (to MCDI) looking for training are women. If we don't actively recruit women into the machining or sheet metal training, for example, then those programs would dry up and die. In some ways recruiting women is a self-fulfilling prophecy for us instructors. It's a necessity today.

The biggest shocker is seeing the number of people who are now in machine occupations training. By increasing the number of women we've increased the size of the whole program. We're at the point where we are almost over enrolled. We'll have to get more instructors. It's such a change from the way it was before. Now, it's a whole new venture! "

-Dan Carroll, MCDI machine shop instructor

Machine Shop Instructor Dan Carroll with MCDI trainee Teresa Serrano.

This report provides an update on the progress of the Women in Machining (WIM) program. It gives an account of the collective experiences of women in the program, discusses lessons learned, and makes recommendations on how to continue to break down the barriers facing women entering the trade. It is hoped that the success of the program will reinforce the need and provide inspiration for similar programs elsewhere.

Increasing access to skilled and technical occupations is vital to the empowerment of women as we enter a new decade of changing labor market demographics. Women need well-paying jobs to support themselves and their families. Annual earnings of two-income households are on the decline, falling 3.1% between 1973 and 1984. In addition, there are growing numbers of working women who are heads of households. Still, women earn only 71 cents for every dollar earned by the average working man and 70% of working women are clustered in just 30% of all the jobs in the labor market. These occupations include clerical, retail, nursing, and child care.

Access initiatives for women are becoming a matter of business survival for industries and training providers alike. Women, employers, labor unions, and community organizations have much to gain through coordinating efforts to develop and support such programs. Increasing access benefits the local and national economy as well by raising women's family income and in the long run reducing the number of women on public assistance.

B. THE ROLE OF THE MASSACHUSETTS CAREER DEVELOPMENT INSTITUTE AND THE MACHINE ACTION PROJECT IN THE WOMEN IN MACHINING PROGRAM.

The Machine Action Project (MAP) is funded by the Industrial Services Program through the Massachusetts Executive Offices of Labor and Economic Affairs. It is designed to research and develop initiatives to strengthen the metalworking industry in Hampden County. MAP takes a community-based approach that brings together industry, labor, education, and government to meet common goals. The WIM program is one such initiative. WIM is interested in how it can help industry address labor shortages in the short run. But more importantly, the program offers long-term strategies for breaking down occupational segregation in machining and other fields. MAP developed recruitment strategies and women-oriented support services essential to the success of the program, and provided technical support to the staff at the Massachusetts Career Development Institute and direct services to women in the program.

WIM training takes place at the Massachusetts Career Development Institute (MCDI) in Springfield. MCDI provides occupational training to low income youth and adults. Training areas offered include clerical, food service, nurse's aide, electronics, sheet metal fabrication, and machine occupations. A large percentage of the population served by MCDI are women, linguistic minorities and people of color. There are a variety of support services in place. English as a Second Language (ESL) and remedial math and reading classes are taught. The program is extremely fortunate to have a child care facility located one block from MCDI with spaces available for trainees' children.

The machine occupations training program has a continuous enrollment policy. It is self-paced, lasting 20-40 weeks, and includes a tool and die component for students interested in more advanced training. Women and men participate in the same training curriculum. They attend classes in blueprint reading, drafting, math and quality control. They receive instruction on milling, lathe, grinding, and computer numerical control (CNC) machines.

C. THE METALWORKING INDUSTRY.

When MAP began its research in 1987 the Hampden County metalworking industry appeared to be in sharp decline. Since 1980 over 6000 metalworking jobs were lost due to major layoffs and plant closings. But while large factories in the area employing hundreds of workers had been closing, MAP identified a thriving small shop economy of over 350 shops, employing 15,000 workers. A typical small shop employs 25-30 workers. There are approximately 30 large shops in Western Massachusetts, each employing over 100 workers.

Small contract machine shops generally do not have products of their own. Instead, they bid on machining work being offered by larger manufacturers throughout the United States. Major markets include defense, aerospace, medical equipment, computers, and machine tools. Quality, research and development capabilities, and on-time delivery are critical. These shops produce small lots of components and parts requiring constant changes in the set up of machines.

Skilled machinists must read from complex blueprints and set up and operate several machines. While hundreds of local layoffs suggested that there were plenty of machinists to fill skilled small shop positions, research determined that employees from large shops usually lacked the skills needed to work in small shops. This is because the production process in the large shops breaks down machining jobs into specific, isolated tasks so that large lots of components can be produced quickly. Therefore, many machine operators from large shops lack the range and depth of skills needed for the work demanded by small shops.

Other factors also influence the local skilled metalworking labor shortage. Skilled workers are

retiring and not being replaced, as evidenced by declining enrollments in vocational schools and lessened participation in apprenticeship training programs (see 1987 MAP report, "Disjuncture in Hampden County's Metalworking Labor Market and What To Do About It"). **In 1987 the average age of skilled machinists was 57.** There is a false conception of the industry because of highly visible plant closings. The industry also carries with it the old image that it is 'knee-deep in oil'.

The reality is that the metalworking industry in Western Massachusetts is on the cutting edge as a user of advanced technology, a foundation for industry growth. A 1987 nationwide study of 21 industries and over 1,300 shops found that only 37% of all metalworking firms in the U.S. have computer numerical control machine tools (The State of Computerized Automation in U.S. Manufacturing, M. Kelley and H. Brooks, 1987). In Massachusetts, by comparison, 65% of machine shops have at least one CNC machine tool. In addition, 35% of machine shops have computer-assisted drafting technology (see September, 1989 MAP report, "On the Cutting Edge: Advanced Technology Usage in Western Massachusetts Metalworking Firms"). Many area employers also see the advantages of a clean, well lit, and supportive environment for employees. One shop owner, for example, constructed a new plant making sure that there was plenty of natural lighting, bright wall colors, central air conditioning and noise control. Another employer with comparable facilities added an employee gym.

While many employers are going to great lengths to attract and keep employees, they still cannot meet their need for skilled workers. The contradiction: **that skilled positions offering good wages and great advancement opportunities are left unfilled, while women and people of color are virtually absent from area shops,** led to the development of the Women in Machining program.

D. MAKING AND BREAKING STEREOTYPES: AN HISTORICAL LOOK AT ROSIE THE RIVETER.

In the 1940's Rosie the Riveter became a national symbol of women's work in wartime industries. Massive government-sponsored propaganda was developed to draw women into manufacturing jobs usually held by men. Billboards, magazine advertising, and television clips were geared towards disproving stereotypes that kept women in the home. Slogans stressed the transferability of skills such as in this example: *"If you've used an electric mixer in your kitchen, you can learn to run a drill press."* The number of married women wage earners nearly doubled. Even though women's incomes rose substantially, their pay still averaged less than half that of men.

Rosie was always portrayed as a white woman. Women of color had to fight for employment in wartime industries. Only after a threatened march on Washington by civil rights groups demanding access to wartime production jobs did 400,000 black women enter the factories. People of color, regardless of their qualifications, were often placed in dangerous, and/or less skilled and lower paying jobs, and their children were often denied access to child care centers.

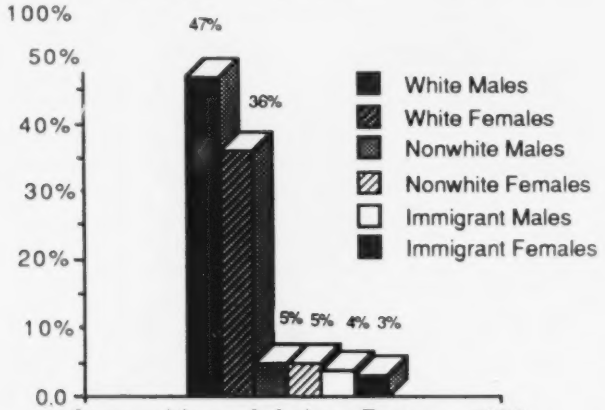
After the war, public opinion changed: while it had been their patriotic duty to work in the ship yards and machine shops, now women were expected to give up their jobs for returning soldiers. Many fought this, but were laid off anyway. Day care centers set up by government and industry closed and new campaigns emerged that held women responsible for neglected, delinquent children.

While the Rosie the Riveter epoch in history was not a strategic political move towards women's economic liberation, it demonstrates that stereotypes of women's capabilities are not rooted in truth. **Post-war stereotypes and other barriers still prevail and must be addressed if women are to be given an equal opportunity to enter and advance in machining and other skilled trades.**

E. DEMOGRAPHIC CHANGES AND THE NEED FOR NONTRADITIONAL TRAINING INITIATIVES.

The criteria for determining the need for programs like WIM cannot be based solely on a demand for labor and the availability of women to fill job openings. Persons interested in starting up programs that increase women's access to training must consider whether the available jobs offer **good wages, growth potential, interesting work, and a receptive environment.** Many skilled trade and technical fields require transferable skills that can lead to a variety of related careers, for example, in the computer or engineering fields. The acquired math and mechanical competencies increase job options and are useful in everyday life. General labor market trends and predictions provide necessary information about job opportunities, but they may be misleading guidelines if counselors and training providers fail to consider the quality of work or future these jobs hold.

New entrants to the workforce will find that they need more math, science, and computer education to keep up with the growth of high-skill occupations. It is predicted that 41% of the jobs created through the end of the century will be in high-skill occupations as compared to 24% today (Hudson Institute). Massachusetts labor force participation data, by years of education completed, indicates that **only about 49% of individuals with less than 12 years of education will ever hold jobs** (Northeastern University Center for Population Studies). There must be a general commitment to provide young girls and boys with the educational background to pursue these fields.



Composition of Labor Force - 1985
(Hudson Institute)

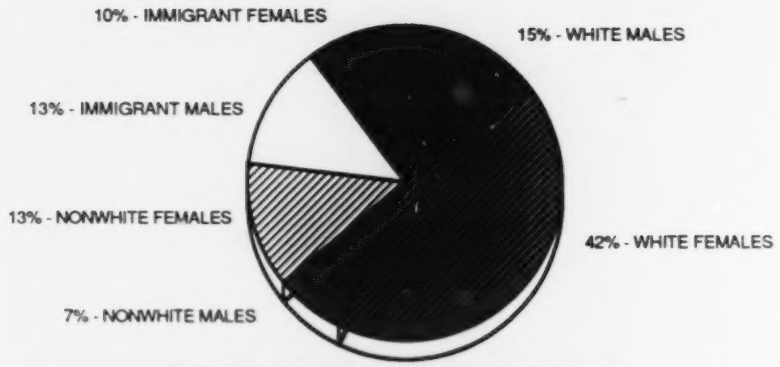
The tight labor supply in Western Massachusetts and changing labor market demographics throughout the U.S. have affected the readiness of training providers and employers to participate in programs that prepare nontraditional or under-represented populations to work in the industry. A May 1989 article in the Wall Street Journal states, *"work-force shortages of the 1990's may accomplish what the activism of the 1960's couldn't: getting corporations deeply involved in broad social issues."* In addition, changing labor market demographics will challenge the issues of occupational segregation that women, African Americans, Hispanics, immigrants, and others are faced with today. Data published by the Hudson Institute in their Workforce 2000 report states:

- Workforce growth will drop to 1% in the 1990's as compared to 2.9% in the 1970's.

- By the year 2000, nearly two-thirds of new entrants to the labor market will be women.

- An additional 20% of new entrants will be non-white and immigrant males.

- Only 15% of new entrants to the labor market will be US born, white males.



NEW ENTRANTS TO LABOR FORCE
1985 - 2000

As women move into the labor force there is increasing pressure on employers, labor unions, and government to help women and men meet work and family responsibilities. Child care is one of the greatest concerns. Two sets of statistics reveal the rapidly changing needs of families:

> - In 1950 the percentage of working mothers with children under 18 years was 24%; in 1986 61% of working women had children under 18 years. - *Urban Institute.*
>
> -By 1995, if Massachusetts follows national trends, we can expect the number of working mothers with children under 18 to increase to about 65%. - *Commonwealth of Massachusetts*

These changes necessitate innovative approaches to providing education, training, and eventual employment in high-technology, high-skill jobs to women and people of color. Employers and training providers who are looking to the future must understand the need for alternatives to the traditional systems of training and employment. Future workforce participants are not being reached as potential candidates for the increasing number of skilled and technical jobs. Some training providers and employers do outreach to populations excluded from these fields, but quite often neither is prepared to meet the institutional and workplace challenges that such an initiative entails.

F. BARRIERS TO WOMEN ENTERING MACHINING.

In machining women face barriers at all levels of the training cycle including enrollment, training, job search, and on the job. Some barriers, like biases in assessment and testing, are tied to a specific stage of the training cycle. Others appear throughout. The barriers discussed below are divided into two sections. **First are those barriers that are specific to stages of the training cycle.** They can often be addressed through strategies implemented by the training organization. **Second are those barriers that are ongoing.** These barriers need to be addressed at several levels because they are more deeply rooted in our social, political, and legal systems. Recognizing the barriers facing women is a first step to identifying solutions.

The barriers women face entering the skilled trades are deeply rooted in male/female sex-role socialization. As children, girls are typically given dolls and tea sets to play with and boys trucks and model airplanes. As a result, boys begin to learn mechanical terminology, they create things using their hards, they work from drawings and directions, and they learn to use tools. Girls may learn to follow the directions in recipes and they may become familiar with using tools associated with cooking, cleaning or sewing. These skills, while they are transferable, do not prepare girls to enter

technical or skilled work.

The socialization continues throughout school. Boys are more often encouraged to take math, mechanical drawing, and shop classes. The segregation in the classroom eventually leads to occupational segregation in the workforce. In addition, the skills that women do learn are not considered as valuable or worthy. This is reflected in the lower wages mainstream women's work commands.

1. Short -term Barriers To Training And Possible Solutions.

Karen knew that she wanted to pursue machining. Before she was laid off, Karen worked as a machine operator making wire springs so she had experience working with her hands and with tools. Even though the work she had been doing was not as highly skilled as machining, she was still doing nontraditional work within the shop. She and her husband had friends who were machinists so Karen had a pretty good idea of what the trade demanded and what it had to offer. For many women, however, just getting into the door of training can be a tremendous accomplishment.

a. Sex bias in assessment, testing, and counseling.

Sex bias in testing restricts women's enrollment into training programs. Ann Strong, a WIM trainee, put it best: *"The barriers to the girls in training are that the men have had previous experience with using the tools, for example. I've never seen some of the tools before! Also some of the men have been exposed to the machines before. I don't feel like I'm behind the guys in math, however. I feel like I have an equal shot at learning everything."* Recently tested at an area machine training center, she did very well in the English and mathematics sections, but had trouble with the mechanical aptitude test. The questions centered around gear ratios, leverage, and weight distribution. One problem depicted two wheelbarrows each carrying a large rock. In one wheelbarrow the rock was down near the wheel. In the other the rock was up near the handles. The question asked, *"which wheelbarrow would be easier to transport?"* Anyone who has used a wheelbarrow knows from **experience** that the correct answer is the one with the rock near the wheel. But for Ann, who had never used a wheelbarrow, this was a question involving physics. The ability to quickly and correctly answer such questions is a measure of exposure to mechanics, and not necessarily of problem solving or mechanical ability.

Mechanical aptitude is often incorrectly viewed as an inherent quality. Mechanical problem solving is learned. The tests measure an individual's experiences, not his/her ability to learn. This may unnecessarily eliminate prospective trainees, especially women.

There are several ways to approach sex bias in mechanical aptitude testing. At home and in school women need to get more exposure to the way machines and mechanical equipment work. But for women who have already missed out on many of these experiences, one strategy is to allow women to enter training with low mechanical test scores. The assumption is that mechanical and problem-solving skills will be learned through classroom exposure. Another strategy is to prepare women for mechanical testing by offering hands-on remediation. There are two pre-apprenticeship programs in the region that do this. The Women in the Building Trades program in Boston prepares women for apprenticeship exams in various building trades. In New Hampshire, STEP-UP gives women hands-on exposure to several different trades.

b. Women often lack information about the range of trade and technical careers available .

Information about career options in trade and technical jobs should be provided to women. It is more likely that women will choose a nontraditional path if they are exposed to the idea, given information about the trade, and supported in their choice. Yet offering women only one or two alternatives to traditional career paths is extremely limiting. Training centers should expand nontraditional

initiatives to include all of the trade and technical areas within the institution. More and better career exploration for women into nontraditional fields should take place at all levels.

The Choosing a Living Wage* (CLW) career exploration workshop is an excellent example of deliberate exposure to nontraditional careers for women. According to Ann Strong, *"I would love to meet more women working in the trade because when I was in the Choosing a Living Wage Workshop I got to meet a woman who loved what she was doing. It gave me the go-ahead to get into machining. She was working with huge parts but she said, 'don't let the heavy stuff scare you. Even the men have to use electronic lifts'. So now I say to other women, go for it! As long as you don't mind getting your fingernails dirty and you can't wear a lot of jewelry."* This workshop can serve as a model for the local unemployment offices, the public libraries, and other agencies that currently offer career exploration as part of their program. The Displaced Homemaker Program has begun to broaden its job search focus to include the CLW workshop.

**The Choosing a Living Wage Workshop is a 16 day career exploration workshop for women that emphasizes well-paying career options. The workshop focuses on jobs that are accessible with one year or less of training. Because many female-dominated occupations pay lower wages, emphasis is placed on expanding participants' career planning to include traditionally male skilled trade and technical fields. The workshop was implemented with assistance from the Machine Action Project on a pilot basis through the Industrial Services Program in Massachusetts.*

c. Math or technical anxiety. Lack of exposure to math and math-related skills.

Women may have difficulty with the mathematics sections of entrance tests because they are discouraged from pursuing higher-level math, mechanical drawing, and shop while in school. Math tutoring and remediation should be available to women before and during training. Schools should be committed to providing women with the math and technical skills necessary to compete in today's job market. Anxiety and lack of confidence in their mathematical ability intimidates some women from entering a nontraditional training program. Inviting role models who have experienced and overcome similar fears to speak at orientation and assessment meetings helps women to overcome math anxieties.

Women machinists pass around parts and blueprints and speak to trainees about their experiences at a support group meeting for women in machining.

A recent graduate of the WIM program described her own apprehension about math to prospective enrollees. *"When I first got into training I didn't think I could do the math. It had been years since I had done any math and some of it I hadn't even had in high school. But they start you out with the basics and work up from there. You can work at your own pace with individual instructors. It's not easy, but, if I can do it you can too!"*

2. Ongoing Barriers And Possible Solutions.

The need for support services cannot be emphasized enough. Biweekly informal meetings or support groups for the WIM participants proved invaluable for the identification of barriers and their resolution. Structured support programs result in improved retention in training. In addition, women get the tools they need to prepare for working and advancing in the industry. The following are barriers women face in training, job search, and on the job. Some were anticipated, and strategies put in place prior to the start-up of the WIM program. Others were identified and addressed as they arose.

a. Lack of affordable, quality child care, especially for early mornings, after school, and for sick children.

Child care is the number one concern for many of the women in the machining program. Child care resources have not kept pace with the increasing numbers of women entering the workforce. In the past, working mothers could leave their children with neighbors and relatives (usually female). Today neighbors and relatives are likely to be holding jobs themselves. For single parents especially, the high cost of child care makes working and getting off public assistance prohibitive. Often there are no openings in nearby facilities. Waiting lists can be extremely long, especially for voucher slots and infant care. The child care needs of both infants and school-age children cannot be met simultaneously. There are transportation problems when centers and schools are not on the same bus lines. Child care problems are compounded for women who are doing nontraditional work. In part, this is because child care is usually seen as a woman's issue. The list of concerns of most machine shop employers does not include child care. Women cannot enter the trade because they can't find adequate child care, yet until there are more women machinists, child care centers and employers will not see the need for expanded or more flexible services and hours.

Lack of early morning child care places serious obstacles before women pursuing nontraditional career paths. Child care hours are generally 8:00 A.M. to 5:00 P.M. Most machine shops begin the day at 6:30 A.M. This presents problems like those faced by WIM graduate Melva Smith. *"It's no easier now that I'm at work. With the kids at the ages they are I can't find child care with the right hours to fit my work schedule. I can't find early morning care so I have to work 2nd shift. But it seems like most 2nd shift jobs are more production work. I make thousands of the same part. I'm not using the skills that I learned at school and I'm afraid that I will begin to forget them. But, I really love machining so I'm keeping all doors open."*

Sick children are not accepted at child care centers and alternatives are almost nonexistent. In Hampden County there is only one center for sick children, located at Providence Hospital. Care for sick children can cost up to twice as much as regular day care.

Here are several short- and long-term strategies WIM uses for addressing child care needs:

(1) Distribute a list of local agencies that offer child care referrals and a list of child care facilities that offer programs in the early morning, after school, late at night and for sick children. Indicate which programs offer transportation to and from school or home.

(2) Invite program graduates who have children to speak at a support group meeting. Encourage counselors from the resource and referral programs to explain how their programs work.

(3) Work with trainees to identify child care needs and options. Placements should be made with child care considerations in mind. Counselors at the training center should be well-informed about child care resources and options available in the area. Ideally, a large training center should have a full- or part-time child care counselor. Child care needs must be addressed immediately as women enter training because of the long wait to get into programs. Women should be assisted in arranging back-up child care for emergencies.

b. Lack of information about the local metalworking industry and its varied career opportunities.

Because women do not usually know other women working in machining and other skilled trades, they lack a network to find out about available jobs. The network men use in the trades is often so subtle that women may not be aware it exists.

It typically works like this. A friend knows someone who works in a machine shop that is hiring. The shop has good benefits and is staying competitive by introducing new computerized equipment. The employer wants to hire someone who will eventually learn to use the new equipment. Another friend, who works as an automotive technician, is in the state apprenticeship program and knows who to contact to find out about apprenticeships and evening classes in Computer Numerical Control machining. In this way men find out about job leads, which positions and workplaces offer good opportunities, and where the industry is headed in the future.

Women need this information as well. The support programs at MCDI are designed to provide women with information about the trade. Encouraging trainees to communicate with each other after they are working in the field is important. This can be done by inviting them back to talk with new trainees, by helping to set up a support group for women working in the trade, and by creating an alumnae guide with addresses, pictures, and short biographies of graduates. Guest speakers, including shop owners, apprenticeship officials, and union officials, are regularly invited to class to talk about their experiences in the industry. Last year two women from the program attended the First Annual Massachusetts Tradeswomen Conference in Worcester. They said it was inspiring and informative. They were amazed at being in a room filled with 70 tradeswomen.

c. Sexual harassment and discrimination.

Sexual harassment is unwanted sexual attention. In the educational or work environment it deprives people of one sex of opportunities that are enjoyed by persons of the other sex. Sexual harassment can take the form of verbal remarks and jokes relating to gender and sexuality, gestures such as winking and leering, pressure for sexual activity, unwanted touching, patting, pinching, or a friendly arm around the shoulder, threats concerning one's job, grades, etc. accompanied by demands for sexual favors, and physical assault. Women in the program related these experiences during a support group meeting:

"At first it didn't bother me so much, but now it's out of hand. He winks at me and always tries to get near me. One day in class he kept moving his desk closer to me. When I moved away he put his foot on the bottom of the chair and gave it a big shove. I ended up right next to another person."

"He says women don't belong in the machine shop, they belong at home: barefoot and pregnant!"

"He talks about his 'big muscle'. You've got to ignore him. When he talks to me I don't pay attention. He asks, am I listening? I say no, I have other things to do. But I think he's dangerous so I'm afraid to get him mad."

Training centers and employers may be hesitant to admit that sexual harassment is a problem. For women, putting up with the stress and strain of sexual harassment, in addition to the challenges of

training or work, is emotionally draining. It lowers self-esteem and motivation. Women may drop out of training, quit a job or get fired because of it. They may experience physical illness as a result of the tension. Women are hesitant to talk about incidents of sexual harassment because their claims are often minimized or met with disbelief. Some people believe women are asking for sexual harassment by wearing certain clothing or acting a certain way, similar to the myth that women are asking to be raped.

Although many schools and training programs have general grievance policies, few have written policies for addressing sexual harassment. Developing mechanisms to resolve issues of sexual harassment in training gives women concrete experiences to draw upon when faced with similar situations at work. A well-outlined policy should include definitions of sexual harassment and detail means to prevent it. It should be widely distributed to all students and staff.

d. Opposition or little support from family and friends.

Sharon's story is typical of those told by women in the program. *"Before I was laid off, my husband and I operated the same kind of machine at the same company. He didn't mind that we were equals at work or that I was the only woman doing men's work there. At first he wanted to help me with my homework. But, now that I'm doing math and blueprints that he doesn't understand, he gets angry. He says he doesn't know why I bother with it. He reminds me that money has been tight since I've been laid off. I tell him that I can make more money if I finish training. I think that's what bothers him. He doesn't want his wife bringing home more money than he is."*

One woman spoke about a lack of opposition as long as *"I still do the house work, get the kids to school, and get dinner. It really hasn't been easy sometimes. At night when I'm trying to do homework he constantly asks me stupid questions. He sees that the kids are distracting me but won't lift a finger to help. He's trying to get me to quit training, and sometimes I think it's going to work."*

As these and other stories were told at support group meetings a sense of relief filled the room as each woman learned that she was not alone. The group brain-stormed a number of solutions to this difficult problem, including inviting friends and family to see the training center, role playing new strategies for communicating with the individual(s), asking a mutual friend to help mediate for you, or when all else fails, cutting off ties with the person.

e. Lack of transportation to get to work.

Finding machine shops that are located on a bus route is becoming difficult as more shops locate in cities and towns surrounding Springfield and Holyoke. This limits job options, since nearly 50% of the women in training do not have cars. Few buses operate early enough and/or have routes to the outlying communities where jobs are increasingly found. Getting to work is even more difficult when children have to be dropped off at a child care facility or school. This is complicated further by the fact that very few child care facilities and schools are open early enough in the morning to accommodate women who have to get to work at 6:30 or 7:00 a.m.

Employers are less likely to hire someone if they know that transportation is a problem. Yet some of the women in training have never learned to drive. One woman dreamed of buying a car once she started working, but making the dream a reality seemed impossible. There were so many details involved such as getting a loan, choosing the right car, and making arrangements for insurance. Getting a car felt overwhelming and unmanageable even though she had been working for eight months and had finally caught up on her bills. But without a car she still feels trapped in a job with little room for advancement.

Solutions to transportation problems include working out car pool arrangements by creating a ride board

at the training center, mapping out routes and posting bus schedules, asking the public transportation authority to add a bus route or extend the normal operating hours, and talking with employers about offering more flexible work hours. Just as with child care arrangements, several back-up systems need to be in place if women are using public transportation or car pooling to work.

f. Financial hardship while in training.

Sue is aware of the fact that her unemployment compensation will run out soon. She is trying to budget her income in hopes that it will carry her through the last two months of training. She is also considering getting a night job to supplement her income, but she's not sure how it will work out. The uncertainty and financial stress is affecting her studies.

Women who have recently lost a job due to a layoff or plant closing usually have difficulty maintaining their pre-existing standard of living. They may have car and home mortgage payments to keep up with. In addition, there are time constraints for collecting unemployment insurance. This can limit career exploration. Part-time and evening work is a viable option for some trainees. However, it often complicates family obligations and creates 15 hour days of training and work. Welfare recipients may not be able to work part-time as receiving pay would jeopardize their benefits.

Some schools have a small emergency loan fund to carry women through a difficult time period and help them to remain in training. Stipends and/or co-op jobs in the trade and modified eligibility guidelines may be necessary to extend the length of time in training.

G. ADDITIONAL BARRIERS TO WOMEN OF COLOR AND LINGUISTIC MINORITIES.

Language and cultural biases affect test scores and limit training options. Tests are usually given in English. This measures an individual's ability to read and understand written English. While an individual may need some level of English remediation before entering a training program in which no bilingual classes are offered, this is a separate issue from testing for the math skills needed to enter training. In addition, English as a Second Language classes often do not prepare individuals for the technical reading or writing skills they will need in machine training or on the job.

There are few African American, Hispanic, or Asian women working in skilled machining positions. This means that women of color have even fewer role models than white women. In addition, some cultures are even less supportive of women working in nontraditional fields than the dominant U.S. culture. Women from these cultures may face stronger opposition from friends and family.

Historically, public education in the U.S. has been officially committed to imparting quality education for all citizens equally. In reality, institutional racism has resulted in creating poor schools with less resources than those located in white neighborhoods, high student-teacher ratios, and lower expectations. This has caused consistently lower academic achievement by linguistic minorities and people of color. It has resulted in limited access to both higher education and better paying jobs that require advanced skills.

"Poor minority children are undereducated in disproportionate numbers across the country. Academically such children may lag behind the national average by up to two years. In large cities as many as 50 percent of minority children drop out of school. The failure to educate these children makes ever harder the task of rectifying economic and social inequities. Job opportunities reside in service and technology industries, but poor minority youths are the least likely to have the social and academic skills these jobs demand. Unless schools can find a way to educate them and bring them into the mainstream, all the problems associated with unemployment and alienation will escalate" (Scientific American, November 1988).

H. SUPPORT PROGRAMS FOR WOMEN IN TRAINING.

To get the Women in Machining program started MAP took deliberate steps to develop contacts with various sectors of the community and to create materials necessary for active recruitment.

First, a survey was conducted of 194 machine shops in Hampden County to identify the presence and skills level of women and people of color working on machines (1988). The survey revealed that only about 7% of metalworkers in the county are women and about 13% are people of color. In addition, women account for less than 1% of the skilled workforce and people of color about 3% (see appendix for complete survey results). The survey helped locate supportive employers as well as women in the trade who could serve as role models for women in training. MAP visited many of these shops and spoke to employers and women workers about their interest in participating in the program. A list was developed and published of 12 employers who gave commitments to hiring WIM graduates.

Second, MAP organized a Committee on Women in Machining made up of employers, women in the trade, community agencies, union representatives, women in training, vocational high school machine shop instructors, and other interested people. The committee helped to develop strategies for implementing the WIM program.

Third, material resources were developed, including a 15 minute video in Spanish and English that depicts women and people of color from local machine shops talking about their likes, dislikes, barriers, goals, and experiences in the metalworking field. MAP also developed brochures in Spanish and English explaining the program, what it has to offer, and where to call for information.

Finally, women were enrolled in the program. Recruitment strategies were implemented both in-house and community-wide. Outreach included press releases to explain and publicize the program. Copies of the brochures and videos were distributed to community organizations and local employment agencies. Strategies at MCDI included showing the video and distributing brochures and other written materials at the Institute's biweekly Orientation and Assessment meeting (O & A). The O&A group consisted of from 10 to 25 women and men referred to MCDI by the Massachusetts Department of Employment and Training, local welfare offices, and community-based organizations. In addition, a panel consisting of women in training and from the trade, employers, and machine shop instructors spoke to the O & A groups. Once in training, the program included the high support services needed to give women adequate information about the industry. Specific strategies are described below:

(1) Shop tours for trainees were set up with employers willing to participate in the program. Trainees benefit by receiving first-hand information about the range of possible workplaces. There are substantial differences between working in a large or small shop. Large shops tend to pay higher starting wages and may offer more shift possibilities. But large shops often produce hundreds of the same component, causing the work to be repetitious and somewhat unskilled. Plants with strict job bidding systems based on seniority make it difficult for women, as new hires, to move to more skilled positions. Small shops often start out paying less, are non-union, located off the bus route, and have longer workdays. Despite this, small shops do have some important advantages over large shops. They require a more skilled workforce trained to handle varied machining jobs. Pay advances are usually tied to skill level. The broad-based skills obtained are highly transferable in the event of a layoff. Locally, small shops are on the leading edge in utilizing new machining technologies.

(2) Biweekly support groups provided women with the opportunity to discuss issues that came up in training, job search, or in their home life. Issues discussed included sexual harassment, their families' reactions to being in training, child care, fears, goals, and information about the industry. Support groups demonstrate to women the value of networking and break down feelings of isolation. WIM invited speakers to talk about sexual harassment. A panel of women from industry shared their experiences. Films like "Rosie the Riveter" were shown to give women an historical context and

demonstrate that they can do the work. Articles and information about local tradeswomen's conferences and events were distributed.

(3) In-class guest speakers talked with men and women in training. This increased students' knowledge of how the industry works. Speakers reinforced the need for skilled machinists.

(4) Mentors spent time with one or two trainees. Typically, the monthly visits lasted one hour. Mentors offered trainees support and encouragement. Discussions focused on barriers to entering the trade and strategies to overcome them, what it's like to be one of a few women working in a shop, how working in the trade has affected their lives, and their future plans and goals. Mentors gained from the experience since they were often isolated on the job, and did not know any other female machinists.

(5) Internships with local employers allowed practical, hands-on experience to be integrated with classroom training. Employers hesitant about hiring women were given the opportunity to see that women can work successfully in the shop environment. The internships consisted of a 6 week period in which a student alternated weekly between the job site and training center. Interns were not paid directly. Instead, each sponsoring employer donated $300 to purchase tool boxes for successful interns.

I. PROFILE AND UPDATE OF WOMEN IN THE MACHINING PROGRAM.

"I was a precision lab technician in the Navy until I obtained a back injury. They said I had to make a career change. The occupational counselor suggested quality control. The Department of Employment and Training suggested that I check out MCDI. So, here I am! My training has consisted of working on Bridgeport milling machines, lathes and math and blueprints. Now I'm starting to learn the CNC 's.

At times I experience barriers, mostly in the shop. You know, as a woman there are preconceived notions I'm supposed to be afraid of the machines; I'm not supposed to be able to follow directions; I'm a woman so I need some one looking over my shoulder. But, I'm proving them wrong! And they're waking up."

- Michele Morgan, machine shop trainee

Michele Morgan, machine shop trainee

"Before I was laid off at my last job, I was running a printing press. I was earning good money so I wanted another job that pays. I like running machinery and working in an industrial setting. I'm not afraid of

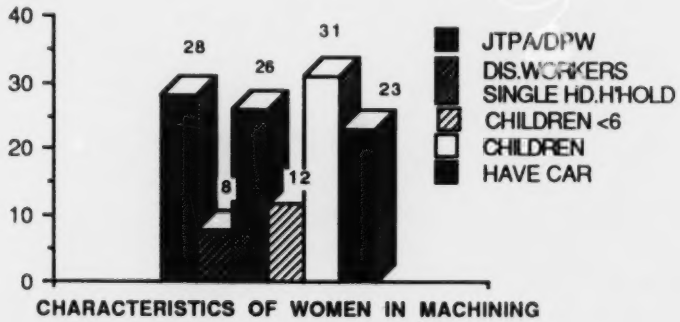
dirt and I don't need to buy brand new clothes for work. I like working with machines rather than people. I like working independently. In the machine shop I'm handling metals and tools. I'm working with objects and making something.

In the beginning my husband said I would never make it. He didn't think I could do it! But, when we visited our friends, they supported me. So, now he's changed his tune. He fixes machinery so he'll be fixing the machines that I'll be working on. It helps because he knows what I'm talking about and can help me." - Ann Strong, machine shop trainee

Melva Smith, machine shop graduate

"The barriers we face as women? The men! I'd have to say it's the men. They say 'machining- that's not for a woman'. Not always directly but indirectly, you can tell. So as long as we get over that this is a man's job we'll be OK. I'm proving to them and mostly to myself that I can do it. When I was in training my day started at 5:30 in the morning. It consisted of getting myself up and getting my two kids off to their day care . We took the bus so I'd drop the kids off then go to school myself. Now I'm working as a drill press operator and am planning to go back to school part time. I want to join the apprenticeship program for tool and die. I am thinking about becoming an instructor some day."
- Melva Smith, machine shop graduate

Since June of 1988 36 women have entered the machining program at MCDI. Prior to the start-up of WIM typical annual enrollment had been 1 to 4 women.

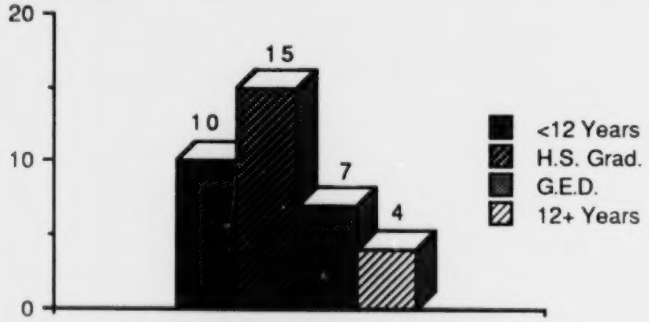


CHARACTERISTICS OF WOMEN IN MACHINING

Only the 36 women who entered the WIM program are included here. Twenty-five are white, 9 African American, and 2 Puerto Rican. Eight women have been placed in machining jobs, 21 are in training, and 7

have left the program.

For the 8 women who went to work in the industry, starting salaries ranged from $6 to just over $9 an hour, with the majority earning between $7 and $8. Five of the women are working in shops with very good potential for advancement of skills. Two of the women took less skilled jobs after completing 2 months of training. One woman found a job through friends in a small job shop doing semi-skilled work , but took a leave of absence after 2 months on the job. She said that she was getting bored doing large batch work. She is now working in a day care center.



LEVELS OF EDUCATION COMPLETED

Of the 7 women who did not complete the program, one transferred to electronics training at MCDI and is now doing electronics assembly at $6 an hour, two went to Springfield Technical Community College, a third has expressed interest in attending STCC, one took a temporary job and never returned and another left MCDI. No information could be obtained on her. One young enrollee had tremendous family pressures, far beyond the capabilities of the program's support services, and was not able to complete the training.

J. RECOMMENDATIONS.

Many of the following recommendations were outlined in the July, 1988 MAP report, "Women in Machining: Opportunities and Barriers in the Hampden County Metalworking Industry, and What to do About Them." New recommendations are included, based on the past year's experiences.

1. TRAINING PROVIDERS.

Because machine training programs are facing declining enrollments, the temptation is to start with recruitment. This is a mistaken short-run strategy. Training providers should **first assess the kinds of jobs male and female graduates have gotten upon completion of training and how their careers have developed.** In 1988 MAP surveyed 27 women who completed MCDI's machine training program within the last ten years. The 19 still working in the trade were interviewed. A number of them were doing women's work within the industry (e.g., assembly, punch press, deburring, etc.). Several were working in shops with few or no possibilities for growth in earnings and skills. Few had any knowledge about the industry and how to advance in it. The lack of affordable, quality child care continued to be a major obstacle to women's advancement in the trade. Interviews and survey results were invaluable for effective recruitment, retention and placement later on because it brought the training center back in touch with many graduates who later became role models for women.

The second step is to determine if there are good jobs for women graduates. It would be unfair to encourage women to enter a field without making a firm commitment to placing them in workplaces with advancement opportunities. Training organizations should take the initiative to seek out employers who are open to hiring women. It involves some added work on the part of the training provider, but there are employers who see the benefits of diversifying their workforce.

Third, look at the training organization itself. Is it supportive of women? Are women getting the information and survival skills they need? Are regular workshops held for staff covering such topics as barriers to women entering skilled trades, institutional racism and sexism, and problems linguistic minorities and people of color face in training? Program design should be evaluated, including recruitment, assessment, counseling, curriculum, linkages with upgrading programs, availability of child care, the placement process and follow-up.

Only after these three steps are taken should recruitment be stepped up. The following are some specific recommendations for training providers:

(a) Work with as many machine shop employers in the area as possible to insure good placements. The employer should be openly supportive of training and promoting women. Preferably, the shop will have at least one woman working on machines. Better placements will build a solid reputation for the institution over time. The increased contact with employers improves placement opportunities for men as well. Successful graduates will be more likely to participate in future recruitment efforts.

(b) Employers must be actively involved in every phase of the program. Shop owners should be an integral part of the curriculum development process. This will help the training institution target skills that are in demand, and it will increase employer confidence in the quality of the training.

(c) Pair trainees with women working in the industry. Mentoring visits are a great way for trainees to network with other women in the trade. To be successful, mentors should understand their role in the process. Trainees should know what is expected of them.

(d) Establish ongoing support groups as soon as the program begins. The support group can be started for trainees and then broadened to include women in the trade, particularly graduates of the program. Linguistic minorities and people of color may need additional support mechanisms.

(e) Promote networking through support groups and mentoring. An alumnae guide of women graduates is being planned.

WIM trainees look at new CNC machines while on tour at D & S Manufacturing in Westfield.

(f) Careful follow-up after placement is critical. The training organization should verify that graduates are satisfied with their placements and are not victims of occupational gender segregation. Contact should be maintained with graduates to encourage them to upgrade their skills.

(g) Encourage graduates to consider teaching in the future. Female shop instructors are powerful role models for women considering a trade. Provide information to trainees and graduates about teaching and how to meet certification requirements. Actively recruit certified female instructors. Absent full-time female instructors, efforts should be made to hire skilled tradeswomen to teach particular classes.

(h) Have short- and long-term child care strategies in place. Graduates who have young children should be invited to speak at support group meetings about their experiences finding quality child care. Counselors should be knowledgeable about available resources and options. Work with community and child care organizations to develop centers with flexible hours and offer care for sick children.

(i) Hire a full-time Coordinator of Nontraditional Trades to implement a program designed to provide access to several nontraditional trades for women, linguistic minorities and people of color. A number of vocational high schools in Massachusetts are doing this.

(j) Develop career exploration methods that encourage fully informed, planned decision making. This could involve shadowing a woman in training or at work, going on a shop tour, sitting in on blueprint or math classes, and hands-on experience whenever possible. Women should receive clear information about pay, advancement opportunities, and the range of related jobs available following completion of training.

(k) Work closely with community organizations. With accurate information about nontraditional and other training options agencies can better prepare individuals to make career choices and enter training successfully.

(l) Develop English as a Second Language training components that use relevant vocabulary from several trades and technology fields.

(m) Top administrators of training organizations should be openly supportive of nontraditional initiatives. Any new program mandates changes in routines for instructors, counselors, and placement specialists. Some of the ideas being introduced may be entirely new to them. Discuss with staff the importance of the program. Successful implementation requires an agency-wide commitment..

2. *EMPLOYERS.*

An increasing number of metalworking employers recognize that it is in their interest to tap a larger pool of talent and diversify their workforce. Employers should do the following:

(a) Carefully consider why you are hiring women. Are you interested in having women become skilled, confident, and well-paid members of the work team or do you plan to assign them work you don't think men will have the patience to do? Assess your shop. For example, are offensive posters visible? What are the attitudes of men in the shop towards working with women? Involve workers in the assessment.

(b) Foster an atmosphere of diversity. Engage your employees in discussions where they can air concerns about the impact of hiring women and/or people of color. Agencies are available to assist you in this process (see appendix).

(c) Make a commitment to encourage women to enter and advance in the trade. Help with community-wide efforts to encourage women to enter the trade by giving skilled women in your shop time off with pay to assist training institutions with recruitment and mentoring. Encourage other employers to do the

same. Provide equal opportunities for women employees to attend skills upgrading programs.

(d) Start thinking about how you can make your company's hours of work and benefits package more attractive to employees with family obligations. In machining and many other trades the average work week exceeds 45 hours. Child care becomes more difficult and expensive and employees spend less time with their families. This may discourage women from entering many trades. Flexible scheduling, job sharing and/or a shortened work week are possible solutions. Consider sponsoring on-site, nearby, after school and summer child care programs. Benefit packages may include innovative options such as personal and/or parental leave, child care vouchers, and customized family medical insurance.

(e) Consider the possibility of starting workplace English as a Second Language classes. Such programs are becoming widely used throughout the country. They encourage retention and lead to skills upgrading of current employees for very little cost.

3. *LABOR UNIONS.*

Labor unions can be the greatest supporters of women metalworkers in unionized workplaces. Seniority and bidding systems designed to foster promotion opportunities based on objective criteria (e.g., seniority) have advantages and disadvantages for women. Contracts that contain specific job upgrading procedures provide opportunity for advancement and skill development. But skilled women often enter union workplaces, are hired for women's work, and get stuck in lower-skilled jobs. By the time they have accumulated enough seniority to bid successfully on higher-skilled work, they may have lost the skills they acquired in training. Labor unions should do the following:

(a) Promote an atmosphere of respect for women workers. Examine the status of women in the shop and in the union leadership.

(b) Take the lead in developing in-house training and promotion opportunities for women. Actively encourage women to pursue upgrading training outside the shop. Union leadership should visit area training programs to talk with trainees about the trade, the industry, and working in a union shop. This is sometimes done in the building trades. Encourage women trainees by enabling women union members to lead these discussions.

(c) Establish and maintain contact with the Coalition of Labor Union Women (CLUW). Encourage and subsidize women union members to attend conferences like those sponsored by the Women's Institute for Leadership Development at the University of Massachusetts, Amherst.

(d) Take the lead in working with management to address child care needs of male and female union members. Encourage management to consider setting up a child care center in joint sponsorship with other area companies.

4. *COMMUNITY ORGANIZATIONS .*

Community organizations representing the interests of low-income people are important partners in the effort to provide good jobs for women. Typically, these community organizations provide information on training and work options to their constituencies. Training providers and policymakers should involve representatives of these groups in program design. This will increase the likelihood of programs meeting the needs of low-income women. Community organizations should take their advisory and advocacy roles seriously. They are often the first to hear the good or bad news about someone they have referred to a training program. If they learn that a woman had difficulty getting a job after going through training they are unlikely to make more referrals. Developing a good reputation should be a priority. Community organizations can support the effort in a unique way by providing positive and negative feedback to the training organization.

5. *POLICYMAKERS.*

For policymakers the challenge is to help ensure that women, particularly those with low incomes, are getting the skills they need to enter and succeed in well-paying occupations. All barriers must be addressed. This requires adequate funding. In a time of funding shortfalls policymakers must work with training providers to identify ways of improving programs without dramatically increasing costs. Programs in nontraditional trades should be funded only after strategies for recruiting and placing women have been designed. The following are recommendations for policymakers:

(a) Fund programs to train women presently in traditional female jobs who want to switch to machining and other nontraditional trades. Many women are working, but are caught in low-paying, dead-end jobs. Some may want to switch to nontraditional work, but cannot because they fail to meet current eligibility guidelines for state-sponsored training. Several women responded to news articles on the WIM program, citing low pay and boredom as reasons for wanting to switch fields. They had to be turned away.

(b) Allocate funds to permit adequate follow-up. Once women are placed, little or no follow-up occurs. This means training organizations evaluate the quality of their placements solely on the basis of entry wages. This is not enough to determine a program's effectiveness in preparing women for nontraditional careers. Program quality should be judged on earnings and skill improvements within 10 years following placement. These expanded criteria encourage training organizations to take an active role in promoting skills upgrading courses.

(c) Allocate funds to allow training organizations to provide follow-up career counseling. Since nontraditional trades generally involve an apprenticeship period women need to have an idea of their goals in the trade. Women entering the trade need personal and informed encouragement to work toward a higher level of skill. Semiannual counseling sessions led by someone knowledgeable about training options and the industry would provide the support needed.

6. *WOMEN IN THE TRADE.*

Here are some suggestions.

(a) Believe that you can do more skilled work than you are doing now. You do not need to be satisfied with a job which is not challenging to you. In general, the more skills you acquire and use, the more job security you will have and the more you can earn. Some larger shops may start you off at a higher wage, but you risk being limited to operating a single machine. If you get laid off from that job it may be difficult to find another.

(b) Think about what you want to be doing in several years. You'll probably need more information on the industry or trade. Find out what day or evening skills upgrading programs are available to you. If you'd like to stay with the same company talk to your employer about what you'd like to do in the future (e.g., what machines you want to be trained on, skills you would like to develop, etc.).

(c) If there are other women in your workplace talk with them about experiences you may share. An excellent way to get encouragement and information on what your options are is to talk with other women doing the work you're doing or want to do. Join an association of women in the trade. Go to conferences if you can. Your employer may be willing to help you get to one. It's a risk if you haven't done it before, but it's likely to be worthwhile.

APPENDIX

A. RESOURCES.

***Equity Institute Inc.** For information on workshops for employers and employees on race and sex equity issues. (413) 256-0271, 48 North Pleasant St., Amherst, MA 01002.

*** Greater Boston Coalition of Labor Union Women (CLUW).** Get on their mailing list to get information about conferences. Ask about the Western Mass. Chapter. (617) 482-6483, 44 Bromfield Street, Boston, MA 02108.

***Machine Action Project.** MAP publishes a bimonthly newsletter and has written several reports and brochures about the metalworking industry and training and employment opportunities in Western Massachusetts. MAP has produced a fifteen minute video, available in English and Spanish, exploring career opportunities in machining. It features women and people of color talking about the trade. (413) 781-6900, 1176 Main Street, Springfield, MA, 01103.

***Mass. Coalition for Occupational Safety and Health.** Offers technical assistance, training, education, and political action for people dealing with hazards at the workplace. Workshops available on how to recognize and deal with occupational saftey hazards, e.g., chemicals, asbestos, metals, etc. For information, MassCOSH Boston (617) 247-3456, 41 St. Botolph Street, Room 227, Boston MA 02115, or Hatfield (413) 247- 9413.

***Massachusetts Executive Office of Economic Affairs, Corporate Childcare Program.** For more information about employer supported child care initiatives. (617) 727-8380.

***New Perspectives Inc.** For information on workshops for employers and employees on race and sex equity issues. (413) 256-0367, 66 Grantwood Drive, Amherst, MA 01002.

***The Nuts and Bolts of NTO: A Handbook for Recruitment and Training, Support Services and Placement of Women in Non-Traditional Occupations (1980).** Book contains sample sexual harassment and grievance policies suitable for training institutions. For a copy call Technical Education Research Center, (617) 547-0430.

***Occupational Hazards Hotline.** To identify specific substance hazards and their effect on your health, e.g., chemicals, asbestos, metals, etc. (800) 322-5014.

***Pregnancy Environmental Hotline.** If you have specific questions about the health hazards to pregnant women call, (800) 322-5014, M-F, 9-4:30.

***Resource/Referral Program, Everywoman's Center, UMass, Amherst.** Information available includes: listings of specific tradeswomen, a job bank which lists employment opportunities and career referrals, and library books about women in the trades. (413) 545-0883.

***WorkAbles for Women, Debora Evens Crawford.** Get on mailing list for catalogs of women's work clothing, boots, gloves, aprons, etc. Oak Valley, Clinton, PA 15026-0214. Call (412) 899-3555.

***Women in the Building Trades.** c/o Roxbury Community College, 1234 Columbus Ave., Boston, MA 02120. Call (617) 266-2338.

***W.I.T., A free Newsletter for Northern New England Women in the Trades.** (802) 748-3308, c/o Step-Up, 1 Prospect Street, St. Johnsbury, VT 05819.

Size of Shop by # of Employees	A # Shops w/ complete data on women	B # Total metalworking jobs represents (# Total emps. reduced by 10%)	C # Shops that report women employed "on machines"	D # Women reported to be employed on machines	E # Women reported as "Machinists"	% Shops that report women employed on machines	%Metalworkers who are women	% of all Metalworkers who are skilled and women	% Women metalworkers who are skilled
						C ÷ A	D ÷ B	E ÷ B	E ÷ D
1-5	37 shops	121	3 s[illegible]	3	1	8.1%	2.4%	.82%	33%
6-25	95 shops	1,192	15[illegible]	36	6	15.7%	3.0%	.50%	16.6%
26-50	35 shops	1,271	14 shops	138	5	40.0%	10.8%	.39%	3.6%
51-100	16 shops	1,067	10 shops	74	14	62.5%	6.9%	1.31%	18.9%
101-200	11 shops	1,576	7 shops	112	5	63.6%	7.1%	.31%	4.4%
TOTALS	194 shops	5227 jobs	49 shops	363 women	31 skilled women	25% shops	6.9%	less than 1%	8.5%

Size of shop by # of employees	A # Shops w/ complete data on minorities	B #Total metalworking jobs represents (# total emps. reduced by 10%)	C # Shops that report minorities employed "on machines"	D # Total minorities reported to be employed on machines	E # Minorities reported as skilled "machinists"	% Shops that report minorities on machines	% Metalworkers who are minorities	% of all metalworkers who are skilled and minority	% Minority metalworkers who are skilled
						C ÷ A	D ÷ B	E ÷ B	E ÷ D
1-5	37 shops	121	4	4	4	10.8%	3.3%	3.3%	100%
6-25	87 shops	1,086	23	59	22	26.4%	5.4%	2.0%	37.2%
26-50	26 shops	953	18	128	20	69.2%	13.4%	2.1%	15.6%
51-100	11 shops	725	7	35	19	63.6%	4.8%	2.6%	54.2%
101-200	10 shops	1,515	9	289	29	90.0%	19.0%	1.9%	10.0%
TOTALS	171 shops	4,400 jobs	61 shops	515 minorities	94 skilled minorities	35.0%	11.7%	2.1%	18.2%

Employment data was adjusted to account for office staff.